

REMARKS

Claims 1-11, 13-15, and 29-34 are currently pending in the application. By this amendment, claims 1 and 13 are amended and claims 29-34 are added for the Examiner's consideration. Claims 12 and 23-28 are canceled. The above amendments do not add new matter to the application and are fully supported by the specification. For example, support for the amendments is provided at Figures 4-5 and at paragraphs 0029-0032 of the specification. Reconsideration of the rejected claims in view of the above amendments and the following remarks is respectfully requested.

Objection to Claims

Claims 12 was objected to for a typographical error. By this amendment, claim 12 has been canceled. Accordingly, the objection to the claim should be withdrawn.

Claims 23-28 were objected to for phrases in the preamble and for repeating limitations. By this amendment, claims 23-28 have been canceled. Applicants reserve the right to file these claims in a continuing application. Accordingly, the objection to the claims should be withdrawn.

35 U.S.C. §102 Rejection

Claims 1-4 and 7 were rejected under 35 U.S.C. §102(b) for being anticipated by U. S. Patent No. 6,420,766 issued to Brown *et al.* ("Brown"). Claims 1, 5-6, 8-15, and 23-28 were rejected under 35 U.S.C. §102(b) for being anticipated by U. S. Patent No. 6,214,679 issued to Murthy *et al.* ("Murthy"). These rejections are respectfully traversed.

To anticipate a claim, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. MPEP §2131. Applicants submit that the references supplied by the Examiner do not show each and every feature of the claimed invention.

The instant invention generally relates to a semiconductor device and method of manufacture and, more particularly, to a semiconductor device that includes strained

silicon/silicon germanium field effect transistors with a protective silicon layer. Claim 1, which includes the features of original claim 12, recites in pertinent part:

...forming a first silicon layer over the raised source region and a second silicon layer over the raised drain region;

wherein the first silicon layer formed over the raised source region and the second silicon layer over the raised drain region include cap portions and sidewall portions, the method further comprising a step of forming sacrificial spacers along the silicon sidewall portions.

Neither Brown nor Murthy shows these features, and therefore neither anticipates the claim.

Brown

Brown shows a semiconductor comprising a substrate 2500, raised source 2806, and raised drain 2808. Brown also shows a first silicon layer 3502 and a second silicon layer 3502 formed over the raised source and drain. However, Brown does not include a cap portion or sidewall portions, or the step of forming sacrificial spacers along the sidewall portions. The Examiner implicitly agrees with this since, in the Office Action, there was no assertion that Brown anticipated claim 12. Therefore, Brown does not contain each and every element of claim 1 and does not anticipate claims 1-4 and 7.

Murthy

The Examiner is of the opinion that Murthy shows the features of the claimed invention. The Examiner points to figure 9 and columns 3-8 as disclosing the step of forming silicon layers over the raised source and drain. The Examiner asserts that element 234 is a cap portion and element 232 is a sacrificial spacer along silicon sidewall portions. Applicants respectfully disagree.

Applicants submit that Murthy shows raised source and drain regions without any protective silicon layer. For example, Murthy shows forming raised source and drain regions 218 on a substrate (fig. 6). Murthy shows subsequently applying an oxide layer

to the raised source and drain, and a silicon-nitride layer over the oxide layer (fig. 7). Murthy then teaches selectively removing the oxide and silicon-nitride layers from the source and drain (fig. 8) and performing a high energy deep source/drain implant into the substrate (fig. 9; lines 15-26 of col. 7). Cobalt film 232 is deposited over the source and drain, and a titanium nitride layer 234 is deposited over the cobalt film (fig. 10). The device is heated such that the cobalt film 232 reacts with the source/drain 218 to form a monocobaltgermanosilicide film 236 over the source/drain (fig. 11). Any unreacted cobalt and titanium nitride is then removed (fig. 12).

Contrary to the Examiner's assertion, the implantation step shown in figure 9 and discussed in column 7 does not result in a silicon layer being formed over the source and drain regions as recited in the claimed invention. It is clearly seen in figure 9 that this step does not result in the formation of any layer over the source/drain region. And Murthy makes no mention whatsoever of the formation of a silicon layer during the discussion of this ion-implantation step. Further contrary to the Examiner's assertion, element 234 is in fact a titanium-nitride layer, and is not a cap portion of a silicon layer formed over the source/drain region. Even further, Murthy does not disclose, and the Examiner does not identify any element as, a sidewall portion of a silicon layer formed over the source/drain region. Even further, since there is no silicon sidewall portion, cobalt film 232 does not constitute a sacrificial spacer *along a silicon sidewall portion* as recited in the claimed invention. The above-noted claimed features simply are not present in Murthy. Therefore, Murthy does not disclose the elements of claim 1 and does not anticipate claims 1, 5-6, 8-11 and 13-15.

Accordingly, Applicants respectfully request that the rejection over claims 1-11 and 13-15 be withdrawn.

Other Matters

The specification has been amended to correct typographical errors that have come to Applicants' attention.


Added Claims

New claims 29-34 further define Applicants' invention and are believed to be patentably distinct from the applied art and in condition for allowance, as discussed above.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 09-0458.

Respectfully submitted,
Huiling ZHU

A handwritten signature in black ink, appearing to read 'Andrew M. Calderon', written over a horizontal dashed line.

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